b. In claim 17, it is unclear how the values for n for two of the compounds include values of 1 and 2, since it suggests that the compounds are different but are present as monomers and oligomers, which then leads to the question as to how they are different in light of claim 16 from which claims 17 depends.

c. In claim 18, it is unclear what is meant by "the values for n for the more than one compounds is predominantly 1 and 2". Does it mean that n can be greater tan 2? Is n an integer?

Claim 16 has been amended as requested by the Examiner. The Examiner's concern regarding claim 17 is unclear. Claim 7 provides that the value of "n" may be from 1 to 10 for the compound of formula (I). Claim 7 also provides that compound (b) may have various values of Ar, Z, and R. Claim 15 provides that there is present more than one compound of formula (I). Claim 16 provides that these compounds of formula (I) may vary in the value of "n" (of course the values of Ar, Z, and R may also vary), and Claim 17 further provides that the "more than one compounds" have values for "n" of 1 and 2. Claim 18 contemplates that there are present compounds of at least two different "n" values and that greater than 50 wt% of such compounds have "n" = 1 or 2.

Keeping in mind that "n" for each compound may be from 1 to 10 (an integer since we are focusing on a compound) claims 16 and 17 seem clear. Claim 18 introduces the concept of a bulk make up of a mixture of compounds of varying "n" value. It is believed that claims 17 and 18 are clear as written.

Claims 1-24, 28-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Honda et al. (US 6,211,358) in view of Sand et al. (US 5,104,450).

<u>According to the Examiner</u>:

Honda et al. teaches the preparation of a triacyl cellulose (triacetate) film from a dope with cellulose triacetate having a substitution degree of 2.78, and a triphenyl phosphate as a plasticizer (column 23, lines 40-68). Because Honda et al. teaches that the 120 micron (μm) thick film (web) is dried via annealing with a step function of 50?C, 90?C, 120°C and 140°C (column 24, lines 1-1-), it is the examiner's position that the dried film is isotropic due to the annealing, having little birefringence such that the retardation of a film only 80 micron would be less that 5 nm.

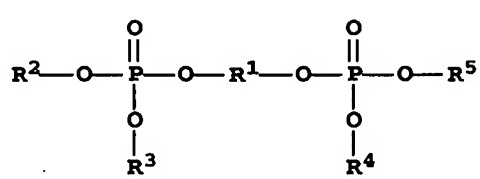
Because Honda et al. teaches that the polymerization degree of the triacyl cellulose (acylate) is from 200 to 700 (column 4, lines 10-45), it is

the examiner's position that the weight average molecular weight limitation of 150,000 to 250,000 limitation is met.

Honda et al. teaches that a plasticizer is added to the triacyl cellulose dope to raise the mechanical strength and to give water resistivity, and that an antioxidant is added to give resistivity to heat and water vapor (moisture) for an optical device containing a liquid crystal imaging element (liquid crystal image displaying equipment). A preferred plasticizer is triphenyl phosphate in the amount of 5 to 30% by weight (column 11, lines 30-68).

Honda et al. teaches the addition of an antioxidant for resistivity to heat and water vapor in the amount of 1 percent, but fails to teach that the antioxidant is an aromatic polyol-bridged polyphosphate compound.

Sand et al. teaches a triacetyl cellulose film (cellulose triacetate) (column 2, lines 15-55) with a degree of acetylation per cellulose unit (acetyl DS per AGU) of about 2.1 to 2.9 (column 3, lines 1-10). Triphenyl phosphate is added as a useful plasticizer (column 6, lines 55-68). Sand et al. teaches that the aromatic polyol-bridged polyphosphate compound (arylene-bis(diaryl phosphate)) has lower volatility 9column 8, lines 50-68) and acts as a better anti-oxidant (better flame retarder) (column 16, lines 35-65). Examples given of the aromatic polyol-bridged polyphosphate compounds are bisphenol A bis(diphenyl phosphate) (column 11, lines 40-60) and resorcinol is used as a bridging diol for the diphenyl phosphate (columns 9-10, lines 30-65). The general formula for the aromatic polyol-bridged polyphosphate compound is shown (columns 3-4, lines 1-70):



Because Sand et al. teaches the use of at least one aromatic polyol-bridged polyphosphate compound (column 1, lines 5-15), the suggestion is there to use more than one aromatic polyol-bridged polyphosphate compound.

Although the relevant peak as determined in the mass spectrum of the aromatic polyol-bridged polyphosphate compound is given (column

11, lines 40-60), the distribution of peaks in the mass spectrum of the preparation is not given, and thus it is unclear whether the aromatic polyol-bridged polyphosphate compounds of Sand et al. are monomeric, oligomeric or mixtures thereof. In the absence of clear comparative data, the examiner has taken the position that there could be mixtures of monomers and oligomers of different n values present in the preparation.

Because water vapor transmission conditions are at higher temperatures, and Sand et al. teaches that the aromatic polyol-bridged polyphosphate compound has lower volatility and behave as anti-oxidant plasticizers, and Honda et al. teaches that an antioxidant is added to the triacyl cellulose film to give resistivity to heat and water vapor (moisture) for an optical device containing a liquid crystal imaging element, it would have been obvious to one of ordinary skill in the art to have added the aromatic polyol-bridged polyphosphate compound of Sand et al. as the antioxidant in the invention of Honda et al. in order to obtain a triacyl cellulose film with the desired low rate of water vapor transmission (high resistivity) for an optical device containing a liquid crystal imaging element.

Applicants' Position

Applicants do not believe that one skilled in the art would have arrived at the present invention from the teachings of the two cited references. Claim 1 is directed to a triacetyl cellulose film containing (a) an unsubstituted triphenyl monophosphate and (b) an aromatic polyol-bridged polyphosphate compound. The benefit of the combination of the invention is that it successfully reduces the ability of water vapor to penetrate the film and thereby is useful to protect a water sensitive material such as a liquid crystal display (LCD) from degradation. This is a concern at room temperature or any other conditions under which the display may be operated. None of the references even suggests such a concern or property.

The Honda reference does not suggest a cellulose triacetate containing component (b) and the Sand reference does not suggest a cellulose triacetate containing component (a). . The component (a) in Honda is suggested

as a plasticizer rather than as an antioxidant as indicated by the Examiner. The object of Honda is to prepare a cellulose triacetate (TAC) dope in a non-chlorinated solvent. The goal is to obtain a TAC film with low turbidity and haze. There appears to be no disclosure about controlling water vapor transmission as for liquid crystal applications, or about retarding flammability or oxidation. In the present application, water vapor transmission is measured using an established ASTM test at 100°F (37.8°C). This does not mean that water vapor transmission is only of concern at elevated (flammability) temperatures as suggested by the Examiner. As is well-known, liquid crystal displays operate at moderate or room temperatures and that is where the water vapor transmission is of concern. Contrary to the Examiner's assertion, water vapor transmission is not a property of concern at high temperatures where flammability is an issue. Fire retardants are effective at flammability temperatures in the range of 500° F and up. At col. 12 of Honda, antioxidants are suggested but do not include phosphates.

Sand is broadly directed to cellulose films of the di or triacetate variety. He suggests including a compound of formula (I) given at col 3, line 35 of Sand as an arylene-bis(diaryl phosphate) compound. This compound is suggested as a flame retardant/formula stabilizing/dimensionally stabilizing plasticizer for materials produced from cellulose esters. At column 6 is a shotgun disclosure of "additives known to those familiar with the art". Among those listed are compounds such as benzoates, phthalates and triphenyl phosphate. Various benzoates and phthalates were tested with the component (b) of the present invention and found to be relatively ineffective for water vapor transmission control (Samples 7-12). So one would have to pick the triphenylphosphate form the unlimited list of known additives.

It is further noted that Sand is directed to the effects of high temperatures (e.g. 400°C) and up. Such properties are related to flammability, volatility, dimensional stability etc. The Examiner's assumption that water vapor transmission is a high temperature phenomenon is misplaced. One would not turn to high temperature properties to resolve a water vapor transmission problem. The fact that water vapor transmission is a recognized problem in the Perregaux reference does not lead to the present invention since the patentee applies a waterproof lacquer to the film.

All rejections depend on the combination of Honda and Sand. One skilled in the art would not be motivated to combine the teachings of these two patents to arrive at the invention. Accordingly, the Examiner is requested to withdraw the outstanding rejection and pass the application to allowance.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is captioned **"Version With Markings To Show Changes Made."**

Respectfully submitted,

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"Version With Markings To Show Changes Made."

16. (Amended) The film of claim 15 wherein at least two of the compounds of Formula (I) have different values of "n". [differ by the value of "n" in formula (I).]